



**Clues as information, the semiotic gap, and inferential investigative processes, or making a (very small) contribution to the new discipline, Forensic Semiotics**

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# Bent Sørensen, Torkild Thellefsen\* and Martin Thellefsen Clues as information, the semiotic gap, and inferential investigative processes, or making a (very small) contribution to the new discipline, Forensic Semiotics

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**Abstract:** In this article, we try to contribute to the new discipline Forensic Semiotics – a discipline introduced by the Canadian polymath Marcel Danesi. We focus on clues as information and criminal investigative processes as inferential. These inferential (and Peircean) processes have a certain complexity consisting of the interrelation between the collateral observations of the investigator, e. g., his background knowledge concerning criminal and technical analysis, the context that the investigator acts within or in relation to (the universe of discourse), e. g., the scene of crime or the criminal law, as well as the clues as information that will cause the inferential processes in the first place. We believe that this focus can tell us something about crime solving that is not just sensitive to epistemological factors (how to know), but also ontological (what to know) and normative factors as well (how to value the processes of crime solving).

**Keywords:** Forensic Semiotics, clues as information, crime solving as inferential processes, C. S. Peirce

I will not bias your mind by suggestion theories or suspicions,  
Watson, said he; I wish you simply to report facts in the fullest possible manner to me,  
and you can leave me to do the theorizing.  
– Sherlock Holmes, *The Hound of the Baskervilles* (1902)

## 1 Introduction

Forensic Semiotics is a new discipline within semiotics and can possibly become a new discipline within Forensic Science. The term – concerning a specific

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branch of criminology – is coined by the Canadian semiotician, linguist, anthropologist, cultural analyst, logician, and mathematician, Marcel Danesi. Danesi is Director of The Research of Forensic Semiotic Unit (RIFS; together with Prof. Antonio Nicaso and Prof. Mariana Bockarova), a unit located at the University of Toronto. RIFS attempts primarily to investigate the sign-based activities at play in crime and criminality and Danesi himself has given the most substantial contribution to the new discipline so far with his excellent monograph *Signs of Crime: Introducing Forensic Semiotics* (2014). Danesi places Forensic Semiotics in the link between real and fictional crime, and using basic concepts and techniques from semiotics he studies and explains, e.g., the meaning and use of symbols, rituals, metaphors, deception, and body language in crime and criminality. In addition, the thinking method(s) employed by the investigator to make sense of the clues left behind by the perpetrator is/are described by Danesi throughout the monograph – hence, the investigation work is sign-interpretation work. As Danesi aptly writes,

Forensic investigators might interpret nail polish as a sign of female participation in a crime scene, but they may also see it as a sign that contains information that can potentially help them locate its manufacturer and subsequently identify the retail stores that may have sold it. This might then help them locate the wearer of the nail polish through store receipts, video recordings, and the like. (Danesi 2014: 14)

We are, indeed, very sympathetic toward Danesi's errand of clearing up and opening this new and promising semiotic discipline. When Danesi mentions that clues at a crime scene are signs that contain information about the perpetrator, we feel especially intrigued. We believe that Forensic Semiotics could benefit from a concept of information. All information is based on signs, special types of signs; however, not all signs are information. We furthermore believe that information is the very starting point of any work of investigation, and that the investigator faces what we will call a "semiotic gap" when he begins to investigate the crime. It is the very information that causes the semiotic gap and "the gap" is a semiotic phenomenon, in which the investigator does not yet know how to represent the information – or make the right inferences – in order to make sense of the crime. However, during his investigations the investigator might be able to close the semiotic gap enough to solve the crime by making inferences from the information – e.g., gun bullets found at the scene of the crime, serving as information, might be matched with the gun possessed by the suspect leading to his arrest and later conviction – a process based on a multitude of networks of inferences that are, of course, not just made by the investigator(s) but also the actors representing the wider legal system.

In the following, we will focus on that part of the investigating work that we believe, particularly, has to do with information; we will, tentatively, define information in relation to ontology and epistemology in order to understand the semiotic nature of information, and thereby see how clues at a crime scene can generate hypotheses that might lead to the perpetrator, his motives, etc. Or, put in other words, information is the starting point in investigation and it engages the intellect of the investigator from his perceptions (observations) over his sub-conscious hunches to his full-blown logical forms of reasoning. We will, thereafter, take a look at our concept concerning the semiotic gap as we believe this concept frames the initial situation of the investigator and it is this gap that the investigator has to overcome in order to inferentially make sense of the crime by, e. g., cohesively connecting clues, and thereby finding a motive and identifying the perpetrator behind the motive. Finally, going from the clues as information to knowledge, and thereby trying make sense of the crime to solve it, we believe that the investigator engages in different but inter-related inferential processes; we will make a Peircean argument concerning this standpoint and we will, furthermore, put forth a few programmatic points why Forensic Semiotics (FS2) can benefit from a Peircean understanding of inference, which we think will add more systematics (and clearness) to the normativity of the investigative work.

In order to illustrate and explain some of our theoretical points, we will primarily use a few examples from American television crime drama mystery series such as “Dexter” and “NCIS.” These series are, of course, simply pop crime fiction (cf. Danesi 2014), but the series, nevertheless, have certain traits that can be seen as exemplary, also noticing with the words of Danesi, “... the correlation between detective fiction and modern-day forensics is undeniable.” (Danesi 2014: 26) and he elaborates as follows: “there is so much collaboration between real forensic scientists and crime fiction ... they think in the same way ... In both real and fictional forensic investigations the same kinds of evidence and tools are used” (Danesi 2014: 67). In short, both manifest themselves through signs, which are observable, interpretable, and can be communicated in coherent ways.

This brings us to the following question: To which part of Forensic Semiotics do we try – in all modesty, of course – to make our contribution? Danesi makes a very helpful division between First-Order (FS1) and Second-Order (FS2) Forensic Semiotics, respectively. Concerning the two orders of Forensic Semiotics, Danesi writes as follows:

The aim of FS1 is to provide specific insights on the evidence collected by forensic scientists in order to help them decode it from a complementary perspective. It can also

help the interrogators and investigators understand how facial expressions, gesture, language, and so on can be used to recognize deception and to identify perpetrators. The second basic way ... is to help gauge the connection between crime, fictional depictions of it, and cultural definitions and perceptions of crime. There is a synergy among these three. The study of this synergy comes under the second-order forensic semiotics (FS2). An obvious example of this synergy is in the partnership that the media and the police have established, with both investigating crime in tandem. (Danesi 2014: 27)

The way in which we understand our efforts to help gauge the relation between clues as information, the semiotic gap, and making sense of clues via inferences and criminal communication fall within FS1 because we believe these elements to be part of the semiotic basis of the work of investigation and the real signs of crime. Therefore, we are fully in line with Danesi when he states, “The more forensic scientists and criminologists know how signs work in the criminal mind the more they will be able to understand and the more they will be able to do something about it” (Danesi 2014: 26). In addition, may we add, the more the forensic scientists know about the semiotic basis of their work the more they will be able to understand the problems that they are facing doing crime detection as well as the formal conditions for their work, also by seeing their critical concepts from new angles – this might help open up new meanings that can enhance their interpretations of crime and criminality.

Our perspective and concepts stem primarily from or are developments of the semiotics of Charles S. Peirce (1839–1914). Peirce’s semiotics (cf. Savan 1987; Liszka 1996; Short 2007) is still unparalleled in breadth and depth (cf. Fisch 1978) and Danesi also brings Peircean concepts to good use in introducing Forensic Semiotics; and Peirce, himself, was not just drawn to the stories of Edgar Allan Poe and Conan Doyle and the semiotic thinking of their two protagonists, Dupin (cf. Harrowitz 1984), and Holmes (cf. Sebeok and Sebeok 1988), but crime fiction was also important for the development of Peirce’s semiotics itself (cf. Fisette 2007). For these reasons, among others, we believe that our way into a concept of information within Forensic Semiotics can begin here.

## 2 Clues as information

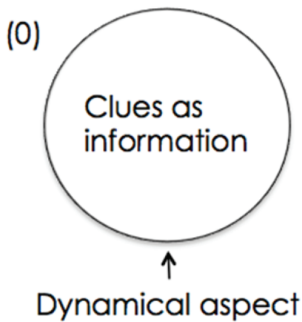
For the investigator there is something rather than nothing and this something means that there is being, a certain kind of being – e. g., a dead body, a bloody knife, or maybe an electronic money transfer made by an American CEO to his own Swiss bank account just a few minutes before his company is declared bankrupt. Hence, there are clues and clues are information. The clues are what

they are in themselves and by themselves. The clues as information are the first premises of any investigation. However, only later the clues might trigger a chain of inferential responses in the investigator(s). This means, of course, that the clues as information have an ontology, a being of their own, or with reference to Peirce, we can say that the clues constitute a so-called dynamical object:

We must distinguish between the Immediate Object, – i. e., the Object as represented in the sign, – and the Real (no, because perhaps the Object is altogether fictive, I must choose a different term; therefore:), say rather the Dynamical Object, which, from the nature of things, the Sign cannot express, which it can only indicate and leave the interpreter to find out by collateral experience. (EP 2: 498)

The dynamical object does not assert anything – e. g., the severed woman's head in Dexter is information whether Dexter Morgan will examine the scene of crime or not, whether he will claim “*no trabajo*” as he does in the first episode of season 1 in the series. Or, the clues as information has real being outside the mind of Dexter Morgan, the clues are non-ego, they do not depend on what he may think, feel, or say about them – they are truly autonomous, or they are not a difference that does make a difference to the investigating mind (Figure 1 – see below).

Clues, we will say, as information, just are. They do not owe their particular meaningfulness to some sort of (almost) magical investigating agency – not even if we in real life should be lucky enough to encounter a spectacular investigator like Sherlock Holmes using very sophisticated guesswork and creative reasoning skills acquiring our applause when he solves the case. Admittedly Arthur Conan Doyle did model Sherlock Holmes after his professor at the University of Edinburgh, Dr. Joseph Bell, a truly pioneering forensic pathologist (cf. Sebeok and Sebeok 1988: 30). However, what if the investigator tries to solve the case with the use of DNA profiling techniques, photographic analysis, or even computer simulations? Does he not – at least to some extent – create the clues as information himself? No, we do not think so because these different kinds of aids or tools used by the investigator are – no more and no less – representations of the clues and it is exactly therefore that they can convey their sign-values as information. Hence, all that the investigator(s) can do – which of course sometimes amounts to years and years of ongoing, tedious investigation in cooperation with several other professionals, e. g., the district attorney and specialists like entomologists and forensic psychologists – is to observe and infer the meanings that the clues as information already have (cf. Ransdell 1979). However, someone might argue, “Why do you need to make this – at least seemingly – common-sense observation that clues generate information on their own accord? Why is it important to Forensic Semiotics?” In addition, someone



### Information as a dynamical object

Ontology – being in itself

Possibility

Actuality

Generality

**Figure 1:** The figure depicts the severed head from Dexter, Season 1, Episode 1. The head and its placement is information independent of what anyone may or may not think, feel, or communicate about it. It has a being in itself; it involves possibility, actuality, and generality – and it definitely (when someone encounters it) causes a semiotic gap (see the next paragraph). The head is placed in a special position and it is the killer’s way of communicating with Dexter as he (and we) will find out later in the series. However, the intentionality of the killer does not affect the ontological aspect of the information as a clue.

else might add immediately, “This observation is not distinct from a naïve realist conception; do you want to anchor Forensic Semiotics in a metaphysics that, e. g., claims that the senses provide the investigator with direct awareness to the external world?” First, we do not see anything wrong with common sense – as long as we can access it critically and revise it when it is necessary to do so. Furthermore, we do believe that the investigator, in fact, perceives and infers objects as they really are and often has a chance to know – if not right now, or soon, then in a matter time (if he is allowed to spend enough time, that is) – how things really are. Hence, we think that Peirce had it right when he wrote, “There is nothing ... to prevent our knowing outward things as they really are, and it is most likely that we do thus know them in numberless of cases, although we can never be absolutely certain of doing so in any special case” (CP 5.311).

Peirce the true polyhistor (cf. Ketner and Kloesel 1986: 376) – coming from, e. g., the scientific disciplines of mathematics, experimental physics, and

biology – found the answer to this puzzle in the very processes of evolution itself: “There are, indeed, puzzles ... with the mental operation of guessing ... There can, I think, be no reasonable doubt that mind’s mind, having been developed under the influence of the laws of nature, for that reason naturally thinks somewhat after the nature’s pattern” (CP 7.39).

However, when we in the above claimed that the investigator can know things as they really are, are we not adhering to a metaphysics of naïve realism? No, because in a Peircean perspective the investigator cannot perceive, feel, think, and/or act without signs. Peirce said the following: “Whenever we think, we have present to the consciousness some feeling, image, conception, or other representation, which serves as a sign” (CP 5.283) – nothing can be involved in a cognitive process if it is only related to itself (it needs an object), and it can only have meaning if it is interpreted in another something (an interpretant or thought). Hence, when the investigator is enacted and engaged in cognitive processes he uses signs, and thereby he always represents as a realist because, as Peirce also accentuated, “a realist is simply one who knows no more recondite reality than that which represented in a true representation” (CP 5.312). However, we did still not explain why we find this observation – that clues, as information, are what they are *sui generis* – to be of importance for Forensic Semiotics. We believe that this observation is important because clues as information – albeit being passive – still have a potential, and it is this potential that constrains the range within which the inferential processes of the investigator can take place. Then how – with the aid of Peirce – can we conceive of this potential? The potential has, we believe, first and foremost to do with the dynamical object; the dynamical object as we have described in the above as something apart from being represented (by a sign). We need to notice with Peirce that there are three modes of being (or three ontological categories so to speak). As Peirce wrote very succinctly indeed,

My view is that there are three modes of being. I hold them that we can directly observe them in elements of whatever is at any time before the mind in any way. They are the being of positive qualitative possibility, the being of actual fact, and the being of law that will govern facts in the future. (CP 1.23)

Accordingly, we should expect that there are three types of dynamical objects and Peirce also came to the same conclusion when he developed one of his later semiotic typologies. Hence, the dynamical object may be a “possibility,” an “actuality,” or a “generality,” respectively. We believe that exactly here we get a glimpse of the potential that constrains the range within which the inferential processes of the investigator can take place. Or, put in other words, the three types of dynamical objects constitute – in three different ways – the clues as



information for the investigator, and thereby the starting point for the signs with which he can think and communicate about the scene of crime. Hence, as an actuality, the dynamical object is capable of acting in a forceful manner on the investigator; whereas the dynamical object as either a possibility or a generality is capable of exciting ideas in the mind of the investigator or appealing specifically to his rationality. However, this description may seem rather abstract, and what does clues as information understood in relation to the three different dynamical objects more precisely reveal to Forensic Semiotics? If we take a look at Peirce's most famous – and according to himself also most fundamental – trichotomy of signs, icon, index, and symbol, we can, however, deduce some further characteristics concerning the semiotic potential of clues as information, because this trichotomy indeed deals with the way in which signs represent their dynamical objects. Peirce gave the following description of the three signs, icon, index, and symbol:

According to the second trichotomy, a Sign may be termed an *Icon*, an *Index*, or a *Symbol*. An *Icon* is a sign which refers to the Object merely by virtue of characters of its own, and with it possesses, just the same, whether any such Object actually exists or not ... Anything whatever, be it quality, existent individual, or law, is an Icon of anything, in so far it is like that thing and used as a sign of it. An *Index* is a sign which refers to the Object that it denotes by virtue of being really affected by the Object ... In so far as the Index is affected by the Object, it necessarily has some quality in common with the Object, and it is in respect to these that it refers to the Object. It does, therefore, involve a sort of Icon ... A *Symbol* is a sign which refers to the Object that it denotes by virtue of law, usually an association of general ideas which operates to cause the Symbol to be interpreted as referring to that Object ... Now that which is general has its being in the instances which it will determine ... and thus the Symbol will involve a sort of index. (EP 2: 291)

This gives us further characteristics to the clues as information regarding their dynamical semiotic potential. Hence, the clues may, firstly, make qualities possible; e. g., every time an investigator tries to infer the identity of a criminal or make a map of his crimes or draw a profile of the criminal, he is, indeed, extracting certain qualities from a range of potentialities. Whether the investigator is working with DNA, fingerprints, or a geographical pattern concerning the area of operation of serial offender, he is orienting himself toward qualities and a potential (suspect). Secondly, the clues may orient the attention of the investigator towards something here and now (in space and time) or towards its very existence; a fingerprint from a crime scene is, of course, a paradigmatic example – the fingerprints stand in a real, casual, and unique relation to a body. However, all clues from a crime scene are, in one way or another, indexes because they point towards something that has happened – a crime. Thirdly, and finally, the clues may exhibit habits, dispositions, or rules; they thereby

point towards regularity (of the indefinite future). That is why it is sometimes possible for an investigator to create a geographic profile of a serial offender; the serial offender will – probably – display certain patterns concerning locating potential victims (in time and space), e. g., based on his mobility (mode of transportation and/or willingness to travel) and his preference of area(s) where he locates his victims (cf. Danesi 2014: 69). When we look at the relative importance for the investigator of the different potentials of clues as information this also shines through in the following description made by Peirce when he wrote,

The value of an icon consists in its exhibiting the features of a state of things regarded as if it were purely imaginary. The value of an index is that it assures us of positive fact. The value of a symbol is that it serves to make thought and conduct rational and enables of to predict the future. (CP 4.448)

To put it into other words: knowledge of icons, indexes, and symbols will enable the investigator to find and exhibit formal, structural features, particular existents, and law-like relations of the crime scene and the criminal(s). However, the different clues as information, most often, tend to blend – as we also remember from the previous description of the three signs, symbols will contain indexes, whereas indexes will contain icons. This also means for Forensic Semiotics, and the crime investigator in particular, of course, that the different clues are always complex signs; but it also tells the investigator to apply methods/techniques in order to discover icons (qualities) and to classify these as indexes and to interpret them as symbols; e. g., blood (icons) at a crime scene is just blood. However, it has a discoverable pattern (symbols) and near a body (indexes) it can provide insights (symbols) into how a murder was committed.

## 2.1 The crime investigator faces a semiotic gap

Each crime and crime scene involve a number of clues (clues as just described in the above), and therefore it also involves a range of possible meanings corresponding to the complexity of the crime committed. Sometimes the crime is so complex that the clues even constitute a plethora of possible meanings (cf. Danesi 2014: 137). Again, in the series, *Dexter*, the crimes committed often are of a highly complex nature, since the solving of them may take the entire season. In season 6, e. g., we encounter religious killings involving Christian mythology (with a reference to The New Testament, Book of Revelation of Jesus Christ to John the Apostle) – the four horsemen bringing tidings of the apocalypse are symbolized by four horses running in the streets of Miami, each horse carrying a mannequin,

to which there are attached the body parts of the killed Nathan Roberts. This, of course, also serves as the dynamical aspect – the starting point for the investigation team in *Dexter*. However, no matter how complex the crime in question is, we believe that the investigator faces – to some degree at least – what we will call a “semiotic gap.” The semiotic gap arises when the investigator cannot make (complete) sense of a crime; when he, e. g., encounters surprising facts, problems, and uncertainties, not to mention ambiguities concerning the clues. Danesi often refers to serial killers, since they are able to disguise their tracks leading the investigator astray by using deviating signs. The proof of this proposition lies in the fact that they are able to kill in series before (or if) they are caught; the serial killers thereby continuously leave the investigator with a semiotic gap to bridge. With Peirce, we can understand a part of this initial situation – an affective response in the investigator – simply as doubt. Not wholly comprehending his experiences, the crime investigator feels that he is in a certain state, as Peirce explained it is, “an uneasy and dissatisfied state from which we struggle to free ourselves” (CP 5.372). We can see this exemplified in the following scene again taken from *Dexter*, Episode 1, Season 1, where Dexter Morgan and his two colleagues, Vince Masuka and Angel Batista, are at the crime scene discussing the corpse of a killed prostitute that was found lying cut to pieces – but there are no traces of blood, in, on or even nearby the body:

So why are you here? – It’s a crime scene ... There’s no blood in or on or near the body at all. It’s the weirdest thing you ever saw ... *No blood. No sticky, hot, messy, awful blood. No blood at all. Why hadn’t I thought of that? No blood. What a beautiful idea!* How is he doing? How does the killer get rid of the blood? It’s hard to say. The body’s in good shape. She got a nice ass, too. Head is over there, if you want to take a look. – This is unique ... And no prints, either. *I’ve never seen such clean, dry, neat-looking dead flesh ... Very clean.* Yeah, but he didn’t finish ... Look. He cut the leg in four pieces, almost like using a ruler. But this leg is in three pieces. Now, look, he started to make a fourth cut but stopped. (Transcript from *Dexter*, Season 1, Episode 1, 2006 – the italicized text is the thoughts of Dexter Morgan)

Dexter Morgan and his colleagues are struggling to escape their doubt and this struggle is a perfect example of an attempt of the crime investigator to bridge the semiotic gap well enough to solve the crime; the crime investigator will gather clues, classify and interpret them; in short, he will seek information purposively and try to turn the information into knowledge. Hence, doubt evokes the thought of the crime investigator, and doubt will stimulate him to act in reflexive way. The doubt of the crime investigator arises when the clues interrupt his “collateral observation,” so to speak, to use yet another concept coming from Peirce. Collateral observation (cf. Johansen 1993: 204–205; Sørensen et al. 2014: 557) as a semiotic concept was explained in the following way by Peirce:

All that part of the understanding of the Sign which the Interpreting Mind has needed collateral observation for is outside the Interpretant. I do not mean by “collateral observation” acquaintance with the system of signs. What is so gathered is *not* COLLATERAL. It is on the contrary the prerequisite for getting any idea signified by the sign. But by collateral observation, I mean previous acquaintance with what the sign denotes. (CP 8.179)

Hence, when the crime investigator is in a state of doubt it is because he does not (yet) possess or is not able to activate the necessary or relevant collateral observations; he cannot (yet), e. g., perceive a given course of events and/or state of affairs in which the clues of the crime can be meaningfully embedded. With knowledge of the biblical version of the four horsemen that bring the apocalypse, detective Mike Anderson – because of his collateral observations – suggests that the killer wants to portray the end of the world; Anderson notes that the colors of the four horses running down the street with the mannequins indeed have the same colors as the horses ridden by the Four Horsemen of the Apocalypse, namely, red, black, white, and pale. This suggestion is the starting point of the investigation of the team and, together with other clues, it will lead to the primary suspects – two religious fanatics obsessed with the end of the world – professor James Gellar and the conservator Travis Marshall (the actual killer). Collateral observation, then, is an important part of understanding the semiotic gap because it forms a certain background for the crime investigator in grasping relations between clues as significant – it can, e. g., consist of his knowledge concerning crime, criminals, and technical analysis. Or maybe, put more precisely, collateral observation is a structure presupposed by the reflexive actions of the crime investigator – beginning with his observations (perceptual judgments) from where he (hopefully) will inhere in coherent logical inferences about the clues as information of the crime (scene). The killer must be “good” (like me) Dexter Morgan concludes in the first episode of season 1, “No blood. No sticky, hot messy, awful blood – what a beautiful idea – I’ve never seen such clean, dry, neat-looking dead flesh.” From this conclusion, his investigations will begin. Dexter – himself being a serial killer – knows how a serial killer feels, acts, and thinks, one of the main points in the series. Hence, this knowledge forms an important part of his collateral observations. Finally, we also see the semiotic gap as related to context. Again, we will apply a concept coming from Peirce, namely, the concept of “the universe of discourse.” This is because the semiotic gap must also be seen in relation to a larger context where indeed the clues of the crime scene must be embedded. Peirce wrote about the universe of discourse, “In every proposition the circumstances of its enunciation show that it refers to some collection of individuals or of possibilities, which cannot be adequately

described, but can only be indicated as something familiar to both speaker and auditor” (CP 2.536).

For the crime investigator to identify and understand the universe of discourse he must have experience that goes beyond the clues as information of the crime scene; or he must, of course, as just described, possess collateral observations. However, there is also a larger context to which the clues of the crime are supposed to relate and it is here that we will find the universe of discourse. The universe of discourse is composed of an – in principle – indefinite number of elements, the most significant of which, however, must be familiar to and well-understood by the investigator. Total knowledge of the universe of discourse is, of course, not possible, but it can be seen as an ideal for leading the investigation if it was not for time and several other resource constraints. Peirce did differentiate the universe of discourse from an ontological viewpoint and this can help us to exemplify a few typical elements of the universe of discourse of the investigator. Not surprisingly, Peirce did make his differentiations according to the modalities found in relation to his categories – as we have seen it also with the dynamical objects – and that gave him, firstly, the universe of possibles, secondly, the universe of existents, and, finally, third, the universe of necessitants or habits and laws (cf. CP 2.517–2.518, 2.556, 4.172). In affinity with Peirce’s tri-division we can see the following elements as representing the three discourses of universe of the investigator (Table 1 – see below):

**Table 1:** Examples of the crime investigator’s three different universes of discourses; the legal system is meaningful based on general conventions, and a DNA index system is a potential for the analysis of samples of biological substances.

Universes of discourse	Examples
Third – laws and habits	The legal system, governance policies, procedural law, management, supervision, and criminal investigation procedures, etc.
Second – existents	Prints, e. g., fingerprints, footprints, shoeprints, tire prints, voiceprints, and handwriting, etc.
First – possibles	Electronic data bases, e. g., DNA index systems, forensic statistics, and photographic collections, etc.

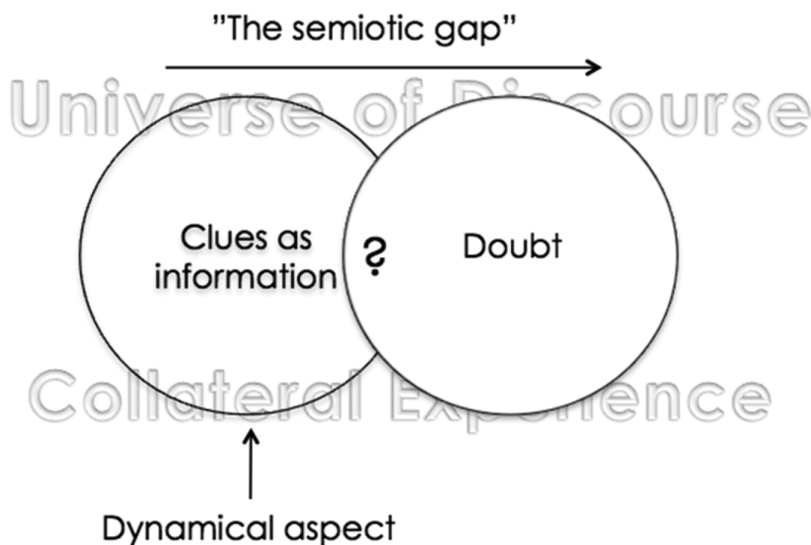
The three different universes of discourse are, then, the complex continuum of experience relative to which the elements belonging to them can be located – when the criminal investigator, e. g., is working with clues, he is at the same time trying to narrow down the universes of discourse, e. g., when he decides to

send some potential evidence to further analysis as a sample of biological substances. However, there is always more than one discursive universe in play when investigating a crime. A criminal, partly has his own discursive universe he acts according to. A serial killer, e. g., the one in the movie *Seven*, partly commits murders according to his own discursive universe, his own understanding of right and wrong inspired by the biblical idea of the seven deadly sins. The same counts for the serial killer Travis Marshall in *Dexter*. In real life, the same counts for famous serial killers like Jack the Ripper, Ted Bundy, the Zodiac killer, etc., as well. The only way the investigator(s) can solve such a crime is to penetrate the discursive universe of the perpetrator in order to anticipate the killer's next move. The discursive universe also exerts pressure upon the investigation since all clues will be interpreted within this context, sometimes leaving the investigators blind to other opportunities. This is what Sebeok and Sebeok point to when they write,

What so often leads the police astray in the Holmes stories is that early in the investigation of a crime, they tend to adopt the hypothesis which is most likely to account for a few outstanding facts, ignoring "trifles" and thereafter refusing to consider data that do not support this position. There is nothing more deceptive than an obvious fact. (Sebeok and Sebeok 1988: 23)

However, when we are returning to Peirce we know that he was a realist which means that the investigator does not construct the universe of discourse; the three types of universes all have being. What the investigator constructs, indeed, is meaning exerted from the information he gathers based on his collateral observations and the pressure exerted by the universe of discourse. In season 6 of *Dexter*, mentioned in the above, the biblical references make up a possible universe of discourse giving meaning to the killings. Within this universe of discourse, we have firsts, seconds, and thirds. E. g., firsts are the electronic databases or DNA index systems, forensic statistics and photographic collections, and the New Testament, etc. Seconds are, e. g., fingerprints, blood spatter, DNA, the four different colors of the horses, the numbers printed on them, etc. Finally, thirds are the legal system, governance policies, procedural law, management, supervision, and criminal investigation procedures, etc. (Figure 2 – see below).

The crime investigator faces a semiotic gap. Constituting one part of the gap are the clues of the crime (scene) as information with an inherent dynamical aspect. The clues will – to some degree – bring the investigator into a state of doubt. However, the very same doubt is also the starting-place for his attempt to solve the crime. Constituting the other side of the gap are the collateral observations of the investigator – his previous acquaintance with what the clues (possibly) denote or his network of experiences where he, to



**Figure 2:** The semiotic gap made up by clues as information (the dynamical aspect), which causes doubt in the investigator. The investigator uses his collateral observations with different universes of discourse.

some degree, can embed the clues (or some of the clues) meaningfully. However, the collateral observations of the crime investigator must be seen in relation to a (much larger) context, a context in relation to which the crime clues become understandable, namely, the universes of discourse. Put differently, there must also be a referential (and a communicative) context in relation to which the clues can be located and which the criminal investigator can give his general attention, e. g., the legal system, procedural laws and databases such as those containing DNA. Hence, the task of the crime investigator is to bridge the semiotic gap enough to solve the crime and that is exactly where the inferences come into play.

## 2.2 Inferences and making sense of clues as information

Making sense of the clues as information and thereby bridging the semiotic gap more and more is an inferential process. Because according to Peirce, all thought is based on inferences, or maybe more precisely stated, the essential function of thought is inferential processes. Hence, Peirce wrote succinctly, "[E] very sort of modification of consciousness – Attention, Sensation, and

Understanding – is an inference.” (W 2: 233). The perceptions of the investigator, then, his uncontrolled and a-critical (unconscious) thoughts, as well as his fully articulated, self-controlled ways of reasoning, all employ the very same fundamental pattern – the exercise of habits of inference (cf. Gallie 1966: 99). According to Peirce, the inferential process – in the most general terms – has at least the following two closely related elements: “ ... the one is the suggestion of one idea by another according to the law of association, while the other is the carrying forward of the asserting element of judgment, the holding for true, from the first judgment to the second” (CP 4.55).

The investigator is reaching conclusions based on specific clues as information, which are serving as premises; hence, if something is true, something else is probably true as well, maybe even with (logical) necessity. Inferential processes are essential to being an investigator; the investigator engages in inferential processes every time he is working on a case. The investigator, e. g., tries to infer behavioral characteristics of the perpetrator or to find his motive(s) and foresee his next move in order to prevent the very same. The inferential processes of the investigator are not random – but parts of the processes, will, of course, always be unconscious. Rather, the inferential processes of the investigator are orderly (according to the law of association, as Peirce said); even though they might result in guesses. Danesi makes an interesting observation concerning inferences and the relation between Peirce and Dupin, the fictional detective created by Edgar Allan Poe: “ ...Charles S. Peirce became intrigued by the thinking style manifested by Dupin, who makes hunches by interpreting the signs left behind by the criminal. Peirce called this style abduction, in contrast to the well-known logical forms of reasoning known as deduction and induction” (Danesi 2014: 4).

However, Dupin could never make hunches, let alone interpret these hunches without, of course, collateral observations. He would have to have some background knowledge to which he can compare the hunches and, only, on that background he could make qualified guesses. Or, he had to narrow down the semiotic gap between the immediate and dynamical objects – making qualified hunches based on inferences or not make the qualified hunches at all. Danesi knows that very well and he also notices how Dupin, indeed, uses an inferential method:

Dupin uses all three modes of logic at various stages of his investigations. He applies deductive reasoning initially to classifying the signs in a systematic way; he then employs inductive reasoning to draw a general picture of the situation; and finally he uses abduction to interpret that picture, which ultimately reveals the true story behind the crime. (Danesi 2014: 4)



Of course, we can also find a clear structure to the investigative processes of Sherlock Holmes – a structure that, as Holmes himself often accentuates, is based on observations and inferences as well, and which, furthermore, indeed, bears a striking resemblance to Peirce’s account of the inferential processes of knowledge in general. As Bonfantini and Proni also explain in their article “To Guess or Not To Guess” (1988),

Holmes starts by observing, recording, and matching up several observational data (induction); he then advances a hypothesis to account for or interpret the observed facts in order to identify possible causes of resulting events (abduction); he sets forth analytically the consequences necessarily inherent in the hypotheses postulated (deduction); he puts the hypotheses and the consequences deduced there from to the test of observation and, in the broad sense, “experiment” (induction). Thus the hypotheses thought up and selected one after another, end by forming a network that converges on the identification of the fundamental hypothesis: the identity of the murderer. (Bonfantini and Proni 1988: 123)

Hence, Sherlock Holmes is, indeed, a “Consulting Semiotician” as Sebeok and Sebeok argued for in their excellent article “You Know My Method” (1988). Holmes is a semiotician; he engages in inferential processes – using abductions, deductions, and inductions – seeing clues as information leading to, e. g., the identity of the murderer. However, can it be otherwise since Peirce stressed how the three inferences – as interviewing – constitute every process of cognition? (cf. CP 5.264–317). No, it cannot – but our point is that explicit and articulate knowledge about the inferential processes in criminal investigation can benefit Forensic Semiotics. Even if this knowledge should come from the fictive universe of Conan Doyle. As Danesi also argues, “The modes of analysis that Sherlock Holmes uses to solve crimes are not much different from those used today in scientific CSI. Both inhere in decoding the signs of crime in a coherent logical way.” (Danesi 2014: 135). There is, naturally, a multitude of methods, techniques, and tools at work within real criminal investigation (cf. James et al. 2002) and if Peirce has got it right – and we believe that he does – this multitude must be explainable within a framework about inference, e. g., a framework involving the three modes of inference: abduction, deduction, and induction, and combinations hereof. Or put into other words: in order to make sense of clues as information concerning a crime – e. g., answering investigative questions of who? what? where? when? why? and how? – the investigator, also in the real world, will always have to draw upon a (more or less vast) network of inferences. Hence, it is at least of equal importance to see how inference is conceived of, acknowledged, and used with reference to real criminal investigation. Here, however, it must suffice in a rather quick manner to point towards a few (of the more authoritative) texts about the topic of real criminal investigation. In

*Handbook of Criminal Investigation* edited by Newburn et al. (2007) we can, indeed, see, references to concepts of inference and also the three inferential modes: abductions, deductions, and inductions. Innes, e.g., concludes how,

... many accounts of police investigative work have sought to explain how information is made sense of by reference to either inductive or deductive modes of inference ... In doing so they are trying to unpack the cognitive processes involved in terms of how detectives make sense of the information that is generated by their lines of inquiry. (Innes 2007: 266)

Innes himself furthermore suggests – based on his observational studies – that the deductive and inductive modes of inference cannot stand alone; the investigator needs the Peircean abductive mode of inference too [sic] in order to reason to the best explanation. Innes argues in the following way: “Particularly in the earlier phases of an investigation, where there is still much to be known and what is currently known is contingent upon facts still to be established, detectives use abductive inferences to synthesize the distribution of evidence and thereafter to project the most likely explanation for this distribution” (Innes 2007: 266).

In *The Cambridge Handbook of Forensic Psychology* edited by Brown and Campbell (2010), we furthermore find, e.g., that Canter presents a framework for investigative psychology in which the “Investigation cycle” gives rise to the field in itself. Inference is here conceived of as the constitutive third part of the cycle – together with information and action – and it covers, in the words of Canter, “ ... the inferences that can be made about criminal activities, its development, differentiation and prediction with the objective of improving criminal ... investigation.” (Canter 2010: 83). Canter also accentuates that knowledge about inferences provides a framework for an understanding of the processes that the investigator must go through in order to solve his case (Canter 2010: 84). Looking at “Criminal Intelligence – Manual for Analysts” made by the United Nations Office On Crime (2011), we also see that a concept of inference is recognized as a central part of the intelligence analysis process – at the operational level as well as the strategic level. Inferences – underlining their primacy – are described as the first truly analytical products within the intelligence process. Using inferences, the analyst will derive meaning from pieces of information, e.g., identifying facts about a crime, but also predicting what will happen in the future and preparing material for testing that can be confirmed or rejected. With affinity, the manual puts forth a typology concerning four different inferences: Hypothesis (a tentative explanation or theory), Prediction (something will happen in the future), Estimation (going from samples to a whole, often quantitatively), and finally, Conclusion (a well-supported explanation). It is easy to see how these four types of inferences within the intelligence process can be explained as such but also as interrelated stages from a Peircean perspective – e.g., Hypothesis and Estimation

correspond, of course, with abduction and induction respectively and Hypothesis, Prediction, Estimation, and Conclusion can be seen as interrelated stages with in the process of intelligence that correspond with Peirce's process of inquiry (Methodetics). In addition, the field of Forensic Metrology – the application of scientific measurement to the investigation of crime – relies upon explicit concepts of inference in order to develop and perform forensic measurements as well as to make critical evaluations thereof. In their book *Forensic Metrology* (2014), Vosk and Emery try to build up a basic framework from which criminalists, among others, can reach sound conclusions based on measured results. The book develops advanced mathematical concepts and principles of inference in metrology and it promises to improve the practices of forensic professionals, e. g., concerning their fact-finding functions. The book is accompanied by a CD with court decisions and legal motions serving as practice material for the forensic professionals. Finally, Bayesian networks and probabilistic inference are also well known within Forensic Science. Hence, Taroni et al. (2006), e. g., has written a book with the title *Bayesian Networks and Probabilistic Inference in Forensic Science*. The book deals with the ever-increasing complexity of forensic information – due to the development within science and technology – by introducing comprehensively to probability theory implemented through Bayesian networks (graphical methods). Thereby, the book offers the investigator ways to discover valid patterns in data (according to us information) and thereby to infer and to construct arguments concerning the analysis and evaluation of forensic evidence on a coherent basis. The above-mentioned texts all, in some way, represent a so-called “scientific approach” to investigation. This approach is guided by a focus on scientific methods and scientific results, which accordingly can be brought into play in virtually all areas and aspects of the investigative work and policing – e. g., collecting and analyzing evidence, criminal profiling, interrogation, and managing investigation as a project (cf. Osterburg and Ward 2000). Furthermore, this approach has as a main premise the idea that explicit knowledge concerning methods and results is possible as well as desirable and, consequently, that good investigative practices can be learned theoretically (and shared) in a classroom and in the workplace and not just at the scene of the crime. With affinity, the investigator must, e. g., acquire and possess highly advanced knowledge stemming from one or more areas of scientific specialization when working towards evidence (cf. Hald and Rønn 2014: 27). There are, however, (at least) two other dominating perspectives about criminal investigation, as we can see from the (review) article “Art, Craft and Detective Work” (2006), written by Tong and Bowling. According to Tong and Bowling, “investigation as a craft” regards investigation as a practice, which primarily is based on “learning by doing” and the handing over of practical experience from older colleagues – e. g., on how to

“construct a case and collect evidence” in the right way in the shortest span of time by extracting true information from false information. The other perspective, “investigation as an art” has similarities with the first-mentioned perspective – e. g., that theoretical education and “book-learning” are insignificant concerning criminal investigation – and there are no particular methods to follow for the investigator. Rather, it is the intuitions of the investigator as well as his practical experience, not to mention his special talents, that will determine the outcome (success) of the investigation (the crime being solved). There is an ongoing debate between the three mentioned perspectives but we do, indeed, agree with Tong et al. in *Understanding Criminal Investigation* (2009) when they write, “It is apparent that art, craft and science skills all play an important part in detective practice ... and this leads us to consider the appropriate skills, abilities, competence and training required for future detectives” (Tong et al. 2009: 10). Here we will, as said before, take the Peircean standpoint that the investigative process – whether it contains elements of a craft and/or an art or not – must be an inferential process. This standpoint leads us to a few preliminary programmatic points concerning Forensic Semiotics (FS2): Forensic Semiotics (FS2) can, firstly, benefit from a Peircean perspective in which there is a focus on an explicit awareness in the investigator concerning inferential methods, principles, and rules. Such an awareness can be taught and will, secondly – most likely – qualify the practices of the investigator more fully and endow his results with more validity (as examples of good reasoning). Or, put into other words, a Peircean perspective on the investigative process as a process of inferences can help the investigator to, e. g., determine the strength of his own and others’ argumentation because he will be more able to identify premises and infer conclusions and evaluate the quality of these as well. According to Peirce, inferences involve leading principles – a principle validates the inference from premise to conclusion (cf. CP 2.464–2.465) – and the leading principles suggest that inferences are performed within the framework of a process, which interrelates certain phases according to three different modes of inference. Therefore, and thirdly, the most important point from a Peircean perspective of the investigative process is, we believe, that the investigator must have explicit and thorough knowledge of the very process itself. This process resembles “the later” developed hypothetico-deductive method, which, of course, also has been applied to criminal investigation (cf. Bryant 2009: 35–69). However, the “Peircean” method has a very strong focus on the “element” of discovery, and probably a more nuanced understanding of deduction as well. From a Peircean perspective, then, the investigator can learn that his inferences about clues can either expand knowledge by incorporating new information into systems already known or, on the other hand, the investigator can increase the relatedness between pieces of information (clues)

within the system of knowledge that already exists (cf. Liszka 1996: 54). Therefore, Peirce concludes that there are two types of inferences: synthetic inferences and ampliative inferences, respectively. This also means that the investigator has two types of inferences at his disposal. Either he can increase knowledge about the clues as information or he can make his knowledge deeper concerning information, or clues, that have already been discovered (cf. CP 2.623). Hence, the abductive as well inductive modes of inference concern the first-mentioned type, or synthetic, while the deductive mode of inference concerns the last-mentioned type, or ampliative. However, the point is, that the different types (or the three modes) of inference have specific roles, but their roles must be understood according to an overall method, and explicit knowledge about this method, we believe, will pave the way for the investigator in order to, e. g., construct more coherent and defensible arguments concerning his analysis and evaluation of clues as information (forensic evidence). Peirce succinctly describes the overall method with the following words: “That which is to be done with the hypothesis is to trace out its consequences by deduction, to compare them with results of experiment by induction, and to discard the hypothesis, and try another, as soon as the first has been refuted” (CP 7.220).

Hence, the overall method consists of forming a hypothesis – making an abduction – and then drawing out the necessary experiential consequences of the hypothesis. Finally, with induction, the investigator will test the experimental consequences of the explanatory hypothesis by experience. Our point is not, of course, that without Peirce we cannot abstract any processual forms or logical steps within the investigative work (today) – we have already seen how inference plays a role within different methods in Forensics. Furthermore, different studies of the actual investigative practices also show – despite a number of different investigative techniques and procedures – that these will tend to follow an overall pattern going from information (clues) to evidence, in order to build up the case. Hence, the establishing of facts then follows analysis and reflection, and finally, building the proof (cf. Fahsing 2013: 129). Our point is, however, that looking at the investigative process from a Peircean perspective is important for at least the following reason: we can define a process of forming and selecting hypotheses with, of course, a clear normative content for the investigator. Or, with Peirce, certain “elements of discovery” can be identified and qualified and by understanding these elements of discovery the investigator, most likely, will be more able to find the best possible explanatory hypotheses concerning the clues. This point is, to the best of our knowledge, not very well described or explained within research.

According to Peirce, we should understand the formulation of a hypothesis as an abductive mode of inference, and he gives the following example:

Suppose I enter a room and there find a number of bags, containing different kinds of beans. On the table there is a handful of white beans; and, after some searching, I find one of the bags contains white beans only. I at once infer as a probability, or as a fair guess, that this handful was taken out of that bag. This sort of inference is called *making a hypothesis*. (CP 2.623)

To show how the hypothesis falls under an inferential pattern Peirce furthermore wrote:

Rule: All the beans from this bag are white

Result: These beans are white

Case: These beans are from this bag

Hence, when the investigator formulates a hypothesis, he is inferring a case from a rule and a result – “these beans are from this bag” is the conjectured conclusion and as a conjecture, it is only provisorily adopted. However, the hypothesis, if true, will explain the observed fact “These beans are white” and therefore the abductive mode of inference is, according to Peirce, “... the only logical operation which introduces any new ideas.” (CP 5.171). There are, of course, other possible conclusions explaining the observed fact in the above-mentioned example, e. g., the beans could come from another bag, which is no longer there. The hypothesis is not certain, but more or less probable, and it involves an element of risk. A further simple example could be,

Last night between approximately 11:45 and 11:50 p.m. there was a shootout at a parking space in the Pacoima neighborhood in the San Fernando Valley (The Valley), Los Angeles. Eyewitnesses saw two groups of young men involved in the shootout. An innocent bystander was seriously wounded while none of the young men involved in the shootout seem to have been killed or wounded.

Detective “Lopez,” who is investigating the shootout, knows that the Pacoima neighborhood has more Hispanic street gangs than any area in The Valley. Furthermore, he knows that the LAPD most recently has recorded a significant increase in gang-related incidents in the Pacoima neighborhood, including several shootouts; in fact, every shootout recorded in this period was gang-related and involved the street gang Latin Times Pacoima (hence this knowledge constitutes a part of his collateral observations). Finally, detective Lopez was told by his colleague that “Diego” and his brother “Carlos,” two well-known and full-fledged members of Latin Times Pacoima, are currently both on parole; and the brothers live in the same block only two miles away from the parking space where the shootout took place.

On this basis, detective Lopez makes two hypotheses or infers abductively that “the shootout last night was related to gang activities” and that “Diego and/or his brother Carlos were probably – somehow – involved in the shootout.” Therefore, detective Lopez and his colleague decide to pay a visit to Diego and Carlos in order to establish where they were last night between 11:00 p.m. and 12:30 a.m.

Remembering Peirce's description of the inferential pattern of hypothesis formation, we can logically reconstruct the hypotheses of detective Lopez as follows:

Firstly,

Rule: All shootouts recently in the Pacoima area were gang-related

Result: Last night there was a shootout in the Pacoima area

Case: This shootout last night was gang-related

Secondly,

Rule: All shootouts recently in the Pacoima area involved the street gang Latin Times Pacoima

Result: Last night there was a shootout in the Pacoima area and Diego and Carlos, known members of the street gang Latin Times Pacoima who lives only two miles away from where the shootout took place, were on parole

Case: Diego and Carlos were involved in the shootout last night

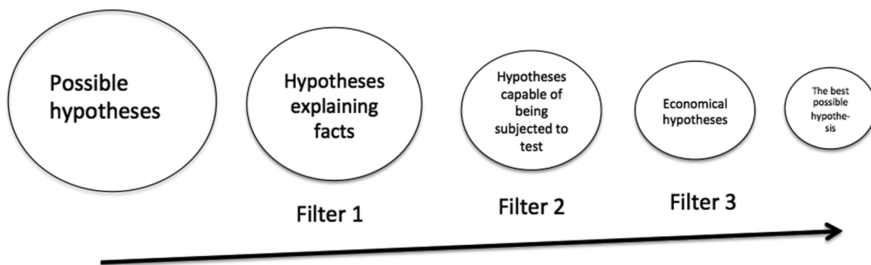
Of course, with these two hypotheses detective Lopez only suggests: “... that something may be” in the words of Peirce (CP 5.171) – hence, “this shootout may be gang-related” and “Diego and his brother Carlos from the street gang Latin Times Pacoima may be involved in the shootout.” It may be the case – but detective Lopez and his colleague may also have to consider, e. g., that Latin Times has numerous gang members in The Valley, some of whom also live within a radius of only two miles from the scene of the crime. However, our point is, simply, that if detective Lopez can recognize the elements of his hypothesis clearly as well as evaluate and discuss these elements, he is more likely to reach sound conclusions and thereby put forth hypotheses that are worthy of further investigation. It seems unusually rare, if at all (unless in the fictional world), to find police reports or accuse fonts in which the arguments present a clear, strictly coherent, and overall network of premises and conclusions – going logically from information as clues to evidence in building up a case. However, if the investigator, firstly, recognizes that his investigations begin with forming hypotheses that must have logical forms (as abductions), and secondly, analyses the formation of hypotheses as a consideration of particular observations relating facts to general rules that will explain them, then we believe he can, in fact, qualify the first phases of his investigation – because knowledge of and a focus on the logical structure of his hypotheses will make him more cable of deciding, e. g., the strength and validity thereof. One thing is, of course, to have an explicit knowledge of forming hypotheses; another thing is to find the best possible hypothesis. Hence, usually the



investigator will be in a situation in which there are likely to be a number of competing hypotheses explaining the facts of the crime, and the question is what should make him opt for a specific hypothesis? However, according to Peirce, abduction also concerns “... the process of choosing a hypothesis” (CP 7.219), or he was presenting certain criteria for favoring one hypothesis over others. From a Peircean perspective, we can say that there are three overall criteria, which the investigator should know:

1. The hypothesis should explain the facts
2. The hypothesis should be capable of being subject to testing
3. The hypothesis should be economical

Or we can say – following Peirce’s criteria – that detective Lopez should consider using certain filters when he is trying to select the best possible hypothesis (see Figure 3).

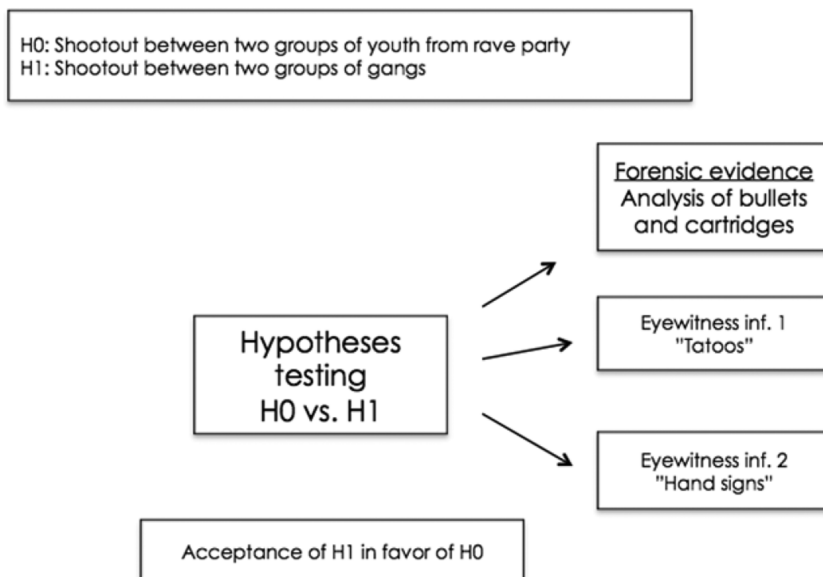


**Figure 3:** Using the three Peircean filters, detective Lopez will, most probably, narrow down the range of possible hypotheses and arrive at the best hypothesis explaining the facts of crime.

Detective Lopez is investigating who were involved in the shootout last night in the Pacoima neighborhood – and he had already formed two interrelated hypotheses: firstly, (H1) “two rivaling street gang were involved in the shootout” and secondly (H2) “two well-known members of Latin Times were involved in the shootout.” However, initially Detective Lopez did also consider (H0) – if the shootout did take place between two groups of young men that do not belong to any street gang. Detective Lopez was informed that more than 100 people attended an underground rave party the same night in the area of the firefigh. Although not generally considered violent events, the two groups may have come from the rave party where they may have had a confrontation, which they afterwards brought to the parking space. Hence, detective Lopez initially had (at least) two competing hypotheses (H0) and (H1). Both hypotheses could, indeed,



explain the observed facts – first filter – that a firefight took place last night in the Pacoima neighborhood. Therefore – according to filter 2 – detective Lopez must also consider if both hypotheses are capable of being subjected to testing. There are a number of tests that detective Lopez could employ to test the pair of hypotheses. He decided, however, to test the two hypotheses with, firstly, information concerning recovered bullets and cartridge cases and, secondly, with information from two eyewitnesses – filter 3 (see Figure 4).



**Figure 4:** Putting the hypotheses to the test: after having deduced conceivable consequences from the hypotheses, the investigator will employ inductive knowledge, which is a result of observations.

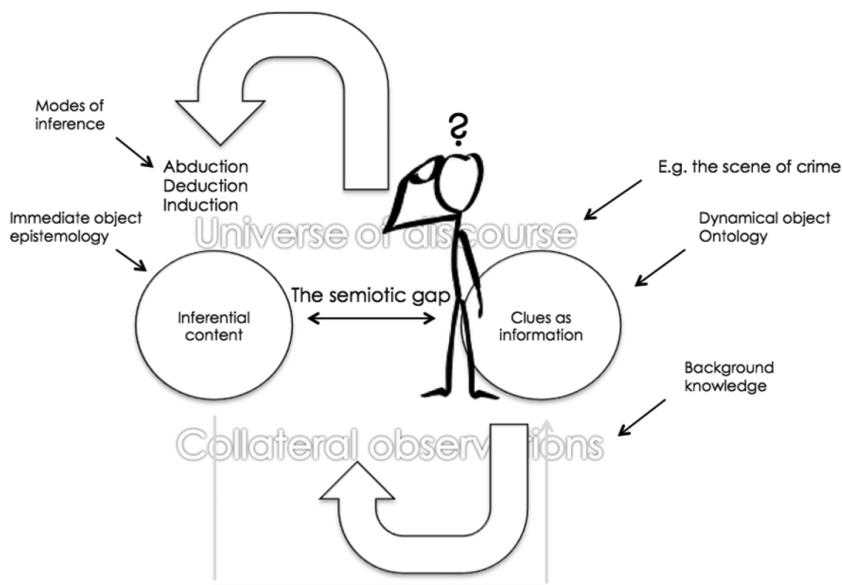
These pieces of information – when interpreted inferentially – showed that both groups of young men used military style assault weapons, that some of them had several tattoos on their arms and their necks, and finally, that one of two groups also communicated by “hand signs” just before entering the area with the parking space. This information made detective Lopez opt for H1 because he knew that street gangs prefer military style assault weapons (“they shoot to kill, not to scare”) and that they establish identity and constitute signatures by, e. g., tattoos and communicating by “hand signs.” In this case the hypotheses were quite easy to test for detective Lopez. Yet, in a Peircean perspective, he should

also always consider an economical aspect concerning the best hypothesis to test: “... the expensiveness of experimentation in ... time, energy and thought” (CP 7.220), in the words of Peirce. Detective Lopez should choose H1 because it is simpler than H2, it contains fewer elements, and therefore the hypothesis was readily eliminable and, of course, quick elimination is vital in the process of investigation. Peirce himself put this in the following way: “... the simplest hypotheses are those of which the consequences are most readily deduced and accompanied with observations; so that, if they are wrong, they can be eliminated at less expense than any other” (CP 4.35). E. g., detective Lopez could easily deduce that if H1 were true there probably would be certain signs on or from the crime scene indeed connecting the shootout to street gangs. Whereas two more “loosely organized” groups of young men – e. g., two groups of friends – would not display the same easy recognizable signs and patterns of behavior. Hence, focusing on these three filters – or trying to move from plausible hypotheses to the best possible explanation – detective Lopez, we believe, will have a better chance of, firstly, identifying the “last” and thereby “most relevant” hypothesis, secondly, qualifying the basis for the next steps in the investigating process, and, thirdly and finally, communicating his choice of hypothesis to his colleagues and, of course, other relevant actors within, e. g., the legal system – especially when he is dealing with very complicated cases with a number of possible hypotheses explaining the crime at hand.

### 3 Concluding remarks

According to Forensic Semiotics, or the part called FS1, as we understand it, solving a crime must take place as inferential processes made by investigators. The processes have a certain complexity consisting of the interrelation between the collateral observations of the investigator, e. g., his background knowledge concerning criminal and technical analysis, the context that the investigator acts within or in relation to (the universe of discourse), e. g., the scene of crime or the criminal law, as well as the clues as information that will cause the inferential processes in the first place (see Figure 5).

We believe that a focus on this interrelatedness can tell us something about crime solving as a process that is sensitive not just to its epistemological factors, e. g., the specific inferential processes made by the investigator from his observations of information to (hopefully evident) explanations, but also how and why clues as information, e. g., physical things, objects, effects, and linguistic material (e. g., a statement from a witness), will cause the inferences of the investigators whereby the



**Figure 5:** Solving a crime takes place as inferential processes made by investigators – the inferential processes, abductions, deductions, and inductions (in interplay) are caused by clues as information in relation to the background knowledge of the investigator and the context with in which he acts.

clues will become intelligible and communicative. Furthermore, and of equal importance, we believe that a particular focus on the (Peircean) modes of inference can benefit Forensic Semiotics and in particular the work of the investigator. Education in and thereby explicit knowledge of methods, principles, and rules concerning inferences will, e.g., help the investigator(s) from a two-fold perspective: Firstly, the investigator will be more capable of recognizing the building-blocks of his arguments – the premises and the conclusions and the relationships between them and understanding how his investigation is a process of complementary inferences and, secondly, the investigator will see how the whole process from hypothesis forming over hypothesis setting to testing are all forms of inferences that can follow certain rules of normativity or rules of good investigative conduct.

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